

Urgent need for moves up the political agenda

112: EUROPEAN EMERGENCY TELECOMMUNICATIONS

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Emergency Telecommunications cover communications from citizen to authority, between authorities and from authority to citizen in case of emergency or disaster. This article offers a brief overview of the existing situation in the area of citizen to authority emergency telecommunications and contains proposals for action to ensure further developments in this field. A complete version of the article is available through the European Emergency Number Association (EENA) website at www.eena.org.

Introduction

Communicating during emergencies, crises and disasters presents no new issue. Aeschylus writes that fire signals transmitted from mountaintop to mountaintop were used in the 12th century BC to inform the city of Argos about the Greek victory over Troy within a few hours of the event (Smythe, 1926). In 490 BC messenger Pheidippides ran to Athens to bring news of the victory of the Athenians in Marathon. The modern Marathon race commemorates his feat.

Introduction to Series

How can the timely response and effectiveness of 112 emergency operations and services be substantially improved, in particular from the perspective of improving relevant (mobile) telecommunications and navigation, positioning and timing infrastructures, as well as operations and services? To answer this question we introduce a series of articles, this first by Olivier Paul-Morandini, who sets a general scene describing Emergency Telecommunications covering communications between citizens and authorities, from one authority to another, and from authority to citizen in emergency or disaster. For 15% of mobile calls emergency services have difficulty or are incapable of sending help due to partial (8,75%) or total (6,25%) lack of relevant information concerning the location of the caller (CGALIES, 2002).

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Today, news about major disasters take only a few minutes to reach major news networks and immediately afterwards millions of households on all continents receive live pictures on their living-room TV screen. In the case of personal emergencies (accidents, fires, interpersonal violence etc.) people can call emergency services to get help as soon as possible. However, this almost instantaneous transmission of information from distant disasters gives a rather false impression of the performance of modern emergency telecommunications, which still face major challenges in ensuring that citizens affected by every emergency and disaster receive timely and high-quality help.

Defining Events

The UN defines emergencies as sudden and usually unforeseen events that call for immediate measures to minimise their adverse consequences (UN-

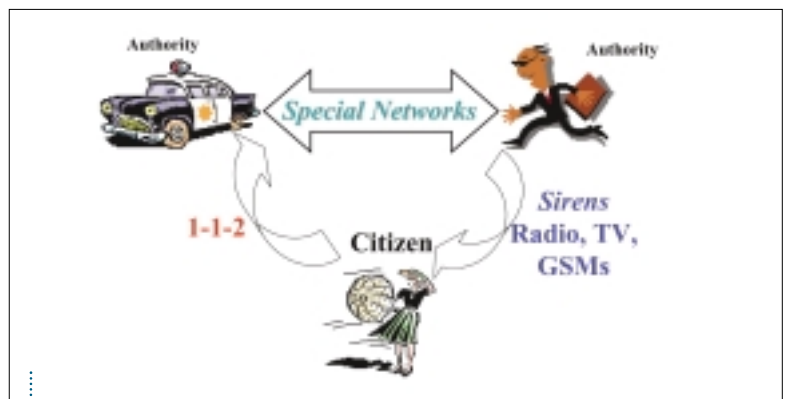


Figure 1 - Scope of emergency telecommunications.

DHA, 1992). Logically, the term 'emergency telecommunications' should thus refer to the telecommunications necessary to deal with emergencies. However, the International Telecommunications Union considers emergency telecommunications to be related only to major disasters (ITU,

2005). More recently the ETSI EMTEL Group established a new and more general definition (ETSI-EMTEL, 2004) based upon earlier proposals by the European Commission (Alevantis, 2001, 2002). This definition has also been endorsed by the Eighth and Ninth Global Standards Collaboration meetings (GSC, 2003, 2004). Thus Emergency (Tele)communications may be subdivided into concerns covering (Tele)communications (Figure 1):

- from citizens to authorities and/or organisations providing emergency services
- between such authorities
- from such authorities to citizens
- amongst affected citizens.

This article deals with the challenges linked to communication between citizen and emergency services, a field that essentially covers 112, the single European emergency call number.

Citizen to Emergency Service

Existing situation

Thousands of emergency call-centres in the EU (the Public Safety Answering Points or PSAPs) receive an approximate annual 200 million calls from citizens in distress (CGALIES, 2002). This estimation correlates well with statistics on the leading causes of death and disease for the European region (WHO, 2000) which include heart attacks, strokes, road traffic injuries, self-inflicted violence, drowning, interpersonal violence, fires, falls and poisoning. In all these emergencies the timely arrival of an ambulance can make the difference between life and death or permanent disability.

In the case of fire, timely intervention may reduce costs amounting to approximately 1% of Europe's GDP (WFSC 2004). And although there are no available EU-wide statistics on criminal acts against life and property, media coverage tends to attribute to such events a primary reason for the increasing feeling of insecurity amongst Europeans, especially those that are mobile. This is a major issue considering that every year more than 100 million Europeans cross internal EU borders for purposes of leisure and business (Räddningsverkets, 2002).

In response to emergency calls PSAPs dispatch ambulance, fire-fighter team or police squad to the aid of the caller. However, only $\pm 40\%$ of calls to PSAPs are deemed 'real' emergency calls, generating a response. The rest come from people seeking information or testing their mobile phones, from children playing etc. Half of all 'real' calls originate from mobile telephones, and this proportion may be much higher in some countries. For 15% of mobile calls emergency services have difficulty or are incapable of sending help due to partial (8,75%) or total (6,25%) lack of relevant information concerning the location of the caller (CGALIES, 2002). One

estimate indicates that implementing caller-location information could save some 5,000 lives annually and assure economies of approximately 5 billion euros for emergency services (Nuttall, 2003).

The percentage of emergency calls resulting in no help may be even greater when the caller speaks a foreign language. An evaluation of the 112 service-chain conducted in Portugal within the context of preparations for Euro 2004 showed that 20% of calls in French and 29% of calls in English resulted in no help at all (DECO, 2004). This even applies to 15% of calls in Spanish and Portuguese: consistent with the CGALIES estimations mentioned above.

Throughout the EU the single emergency call number is 112 (the European 911). This number was established in 1991 and the relevant legislative provisions have since been subsequently improved (EC website). Today Article 26 of the Universal Service Directive (2002/22/EC) obliges Member States to ensure that:

- 112 is available in addition to any other national emergency call numbers, free of charge, to all end users of publicly available telephone services, including users of public pay telephones
- calls to 112 are appropriately answered and handled in a manner best suited to the national emergency systems organisation and within the technological possibilities of these networks
- for all calls to 112 public telephone network operators, as far as is feasibly possible, make caller-location information available to authorities handling emergencies
- citizens be adequately informed about the existence and use of 112.

Available information (EC, EENA) shows that the implementation of 112 within the EU remains quite erratic. Most importantly, 112 is unknown to the majority of Europeans; only one in every five citizens would know to call 112 if faced with an emergency while visiting another EU country (Figure 2). This situation is quite preoccupying for Germany and the UK, as tourists from these countries represent respectively 40% and 20% of the EU total (with France, The Netherlands, Italy and the Scandinavian countries following suit).

Answering and handling emergency calls is highly problematic in several Member States because implementation has not been ensured on the basis of commonly accepted standards. In some countries calls to 112 are answered in several languages, while in others only in the spoken, regional language. In some countries calls are handled by multidisciplinary 112 call centres, while in others calls are routed to the call centres of one emergency service, which may not always be able to transfer these to the appropriate emergency service. Finally, caller-location information (especially for calls

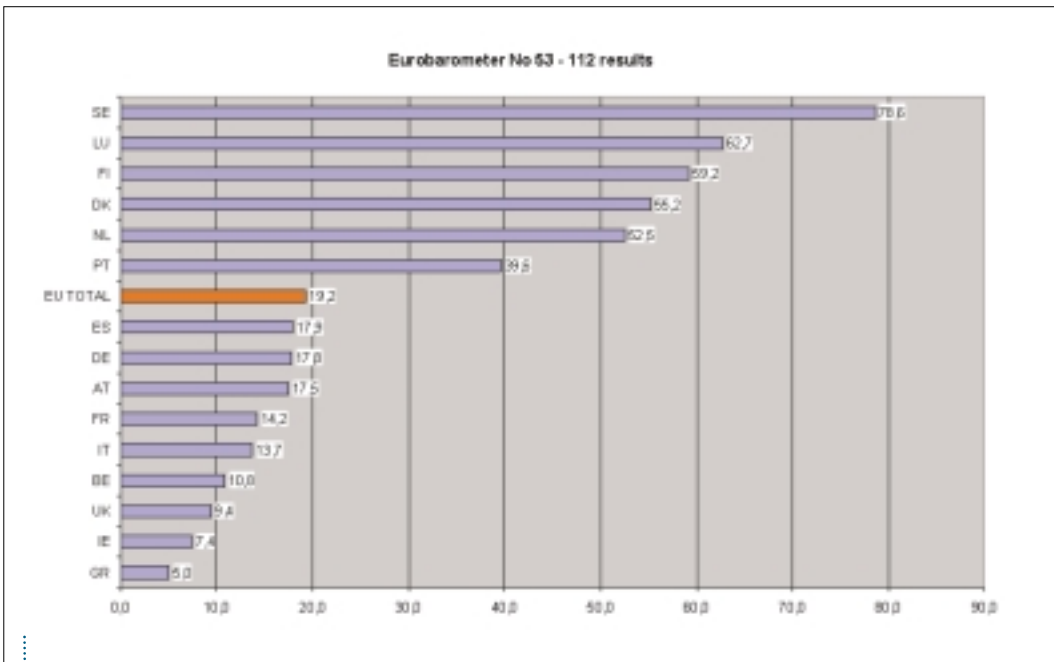


Figure 2 – European citizen knowledge of 112 (see EC site on the 112).

from mobile telephones) is available to the emergency services of very few regions. Citizens have no reason to rejoice in the knowledge that very few countries have established legislation concerning obligatory minimal response and intervention times in the case of emergency; while only Portugal has evaluated the quality of the complete 112 service-chain (DECO, 2004).

Improvements needed

Member States need to ensure that all EU citizens know about the existence and proper use of 112. Unfortunately, some countries running separate emergency call numbers hesitate to publicise the 112, fearing that all emergency calls will then be directed to (often limited) 112 call centres. However, a better informed user population will ensure fewer false calls to the PSAPs, resulting in the optimal use of available resources. Member States must also ensure that all EU territory are properly covered by mobile or fixed operators. Several countries have justified their decision to reduce numbers of telephone booths on the basis of the penetration of mobile telephony, but several remote areas of the EU are not (well) covered by mobile operators and people in distress may face 'network not available' messages when calling 112.

At another level, emergency services should ensure that a common 'front-end' handles all incoming emergency calls to 112. Two types of front-end have been implemented within the EU. In one type independent dispatching centres run by the telecommunications operator (e.g. in the UK and

Ireland) transfer emergency calls to the PSAP of the appropriate emergency service(s). The second type is based on the use of common co-ordination centres incorporating representatives of all the emergency services or run by independent 'specialised' emergency services (e.g. in Sweden, Denmark and Spain). Of course, the option of keeping separate emergency call numbers and ensuring that one of the corresponding PSAPs acts as the 112 front-end can still be practised. But experience has shown that such a solution creates more problems than it solves (tensions between emergency services, allocation of resources, technological incompatibilities, etc.)

Emergency services should also ensure that a call to 112 is 'appropriately answered and handled'. This includes primarily the possibility of multilingual support. Answering emergency calls in many languages does not necessarily imply the use of multilingual operators. In France operators are able to establish a three-way online conference between caller and on-duty interpreter, accessible via mobile phone (FNTU site). Implementing multilingual support is more dependent upon political will than modern technology, although the latter may clearly be of help.

Appropriate answering and handling of calls also involves the use of standardised voice-communication protocols. The Portuguese evaluation clearly demonstrated that operators do not always follow a standard protocol when answering emergency calls. Sometimes they hung up before getting the

exact name and address of the caller. A workshop on the effective handling of emergency calls held in 2002 in Sweden (Räddningsverkets, 2002) demonstrated that the training requirements of 112 operators varied from country to country (with Finland offering the best example: 57 weeks of training for a fully operational operator). This issue is also clearly a matter of political will.

Improving the quality of the 112 service-chain implies the establishment of a standardised minimal intervention/response time. Today only The Netherlands and the United Kingdom are known to practice minimal intervention/response times in emergencies (differing for urban and rural areas). Establishing a pan-European minimal intervention/response time will certainly influence the long-term global costs of emergencies and may prove worth the additional resources required to implement it.

Member States should also implement caller localisation. This is, of course, no simple matter. In some cases the technology of existing call centres is too old to handle location information. In other cases progress is hampered by incompatibilities between existing and required products (e.g. GIS, localisation techniques). The problem seems to concern more the infrastructure of the emergency services than the capability of operators to transfer location data. Back in 2002 the European Commission requested ETSI to develop a common interface between operators and emergency services to facilitate the transmission of localisation data, but this work has not yet been completed.

Finally, another issue concerns implementation of overall quality criteria and evaluation of the quality of the 112 service-chain. Up until now only Portugal has conducted such an overall quality evaluation. We believe that the quality of the 112 service-chain will improve only when the European Commission starts conducting periodic quality evaluations by independent organisations in all the Member States. Special care must be taken for people with hearing and vision disabilities who need special terminals in order to be able to make emergency calls. The needs of the increasing numbers of people accessing the PSAPs over the internet (VoIP) must also be addressed.

From all the above it is evident that improving the 112 service-chain is a complex issue requiring the involvement of many actors, especially political authorities. Technology seems not to be the major issue, although it plays an important role in the equation. The European Commission has a very important role to play by obliging Member States to fully implement current legislation. Failing to improve the quality of 112 could mean that its establishment in fact reduces the level of safety of citizens. Take for example the e-call initiative which

aims by 2009 to equip all new cars in the EU with the capability of automatically calling 112 in case of accident (IP/134, 2005). Buying such a new gadget will not necessarily increase the chances of survival in a car accident if the injured driver has to wait for help which never arrives due to an incapacity on the part of the PSAP to process the automated call received.

Emergency Telecommunications for Citizens

Authorities communicating with citizens

In case of an imminent disaster (chemical or nuclear cloud, terrorist attack, tsunami or extreme weather conditions etc.) authorities need to rapidly alert large numbers of citizens and guide them to safety until the danger is over. Warning systems and practices in the countries of the EU vary and are not standardised. Member States and local authorities have been experimenting with various new systems (intelligent sirens, mobile telephones and car radios) but no generalised solution has ever been adopted. At the same time, EU citizens are clearly concerned about early warning and alert. With millions of EU tourists annually visiting high-risk areas all over the world this issue concerns not only EU Member States but all those countries accepting large numbers of EU tourists.

The EU has already discussed proposals for action but without concrete results. Experts have, for example, concluded that warning should be provided through multiple vectors, i.e. use of audible alarm signals and modern telecommunications networks (mobile telephones, pagers, RDS, etc.), especially to warn people with disabilities. Supplementary information to the public could then be conveyed through classic communication channels (radio, television) or modern networks (mobile telephones, internet, etc.) On the other hand, several pieces of EU legislation, falling under different policy areas and thus uncoordinated, contain provisions on warning and alarm. These could be used as a solid basis for a Community initiative to establish a legal obligation in the case of an imminent disaster to warn, alert and inform citizens by all available telecommunication means and in their own language.

Communication between affected citizens

In case of personal emergencies and/or major incidents or disasters, citizens expect to be offered the possibility to communicate with their relatives, either to inform them that they themselves are well or to get reliable information concerning the condition of the other. However, in several cases of major incidents and disasters network availability and capacity have proven insufficient. Instead, special telephone numbers may be established for re-

laying information through the access of centrally constituted files with names of victims and/or survivors. Additional initiatives may also include the information and training of citizens (especially youngsters) about the behaviour they are expected to adopt in case of such events.

Conclusions and Proposals

Emergency telecommunications concern above all the safety and security of citizens. This means that current efforts aiming at greater harmonisation at EU level should be supported and continued. However, the EU lacks strong political commitment to improvements in this field. Ensuring better and more reliable emergency telecommunications within the EU means that procedures for the development of requirements and processes in specific areas need to be officially endorsed through groups representing government interests. In our opinion this requires the establishment of new structures and processes at both national and European level.

In practice, all emergency services and/or authorities should adopt binding legal acts for the organisation, intercommunication and interoperability of their emergency telecommunication services and systems. Some EU countries (e.g. Belgium) have already established structures and systems and are moving in this direction. Secondly, discussion of all the issues linked with emergency telecommunications should be considered a political priority at an appropriate political level within EU institutions. Improving the 112 service-chain, establishing rules for interconnection and interoperability of systems used by emergency services, ensuring that all EU citizens are promptly warned in case of an imminent disaster: all of these are highly political issues.

Finally, the field of Emergency Telecommunications needs its own big periodic conference and exhibition where administrators and politicians, professional and end users, emergency services and private companies are able to discuss their experiences, needs and products in a horizontal and neutral way. Such an event could act as a common discussion platform upon which to set requirements and help exchange best practices. This would enable the field to develop further towards better serving the citizens and the concept of Europe.

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Biography of the Author

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